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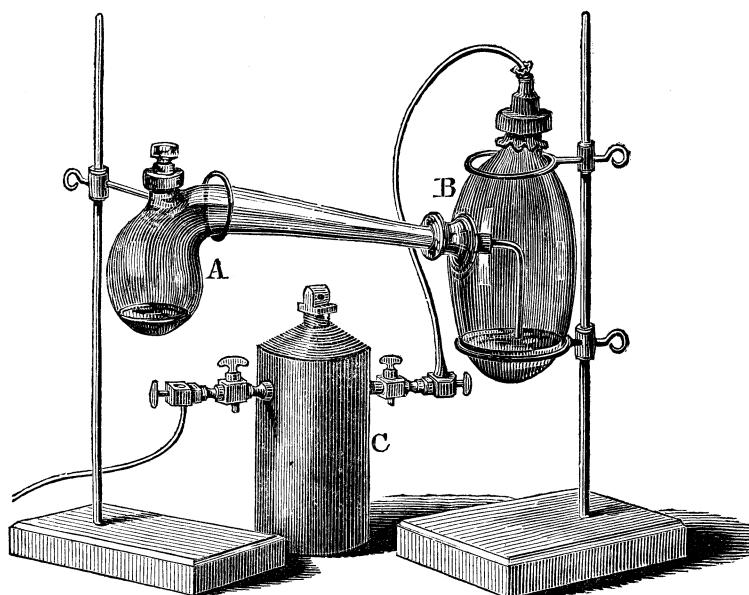
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ARTICLE XIV.

Engraving and Description of an Apparatus, and Process, for the rapid Congelation of Water, by the explosive Evolution of Ethereal Vapour, consequent to the combined influence of Rarefaction and the absorbing Power of Sulphuric Acid. By Robert Hare, M. D. Read May 15, 1840.

IN a verbal communication to the society, made in December last, I alluded to my having previously published a notice of a process for freezing water by the vaporization of ether; in which the congelation was expedited by the employment of sulphuric acid to absorb the ethereal vapour. I afterwards proceeded to state that, by the interposition of a vessel previously exhausted of air, with which a communication could be made by opening a cock, the process had been still farther improved, so as to cause a vaporization of the ether, and a freezing of the water, so rapid as to project the resulting ice against the upper internal surface of the containing vessel with a violence quite audible, as well as visible, to a large audience of my pupils.

I now submit to the society, for publication in their Transactions, an engraving and description of the apparatus employed agreeably to the recent modification to which I have adverted.

The retort (A) contains water covered by a stratum of hydric ether, commonly called sulphuric ether. The vessel (B) holds a stratum of sulphuric acid, of which the depth, at the deepest part, is about two inches. Into the tubulure in the side of this vessel the beak of the retort is ground to fit air-tight, and is made to receive one end of a recurved tube, of which the lower end descends about half an inch below the surface of the acid. A mercury bottle, (C,) of which the mouth is closed so as to be air-tight, is furnished with two cocks, one of which communicates, through a pipe, with an air-pump, the other, in like manner, with the vessel (B.) This bottle is previously exhausted, and kept in a state of exhaustion by closing both of the cocks. The pump being put into operation and the cocks opened, the power of the acid in absorbing the vapour, co-operating with that of the pump, and the vacuum in the bottle, in exhausting the air and vapour from the retort, causes an explosive vaporization of the ether and a rapid congelation of the water. It is upon the novelty of the last mentioned phenomena, and of the means employed in their production, that I rest the pretension of this brief communication to a place in a volume of the society's Transactions.